# Professional Development Module
# Facilitator's Guide

**Title: Planning for discourse using the 5 practices**

**Targeted Audience: 6-12 Mathematics Teachers**

**Description:**

**This PD will help develop understanding of Smith and Stein's five practices for orchestrating productive mathematics discussions: anticipating, monitoring, selecting, sequencing, and connecting. Teachers will analyze the framework and apply it to an existing lesson.**

**Outcomes and Success Indicators:**

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| ***Outcome #1 Know the 5 practices for mathematical discourse*** |
| ***Success Indicator: List in order and describe the 5 practices*** |

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| ***Outcome #2 Use the 5 practices for effective use of student responses*** |
| ***Success Indicator: Incorporate the 5 practices into an existing lesson of high cognitive demand*** |

**Time Frame: 3 hours**

**Agenda:**

| Minutes | Activity and Procedure for the Activity | Materials |
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| 10 min | **<u>Welcome, Introductions, Review Outcome, and Agenda</u>**<br><br>Intro: (There is a PowerPoint available in Presentation Materials)<br><br>Have participants introduce themselves either by table or entire group, depending on the size of the group.<br>○ Name<br>○ Where you're from<br>○ A mathematical symbol that represents you and why<br><br>Outcomes | ● Optional PowerPoint in Presentation Materials folder<br>● Note Cards<br>● Pens or markers<br>● Optional Resource: "5 Practices for Orchestrating Productive Mathematics Discussion" by Margaret S. Smith & Mary Kay Stein |

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| | Norms<br><br>Agenda | |
| ½ hr | **Activity #1** Garden Problem<br>Participants will engage in the Garden Problem in pairs or small groups. Tiles should be made available for use as manipulatives. As the participants are engaging in the problem, the facilitator will fill in a monitoring table as he/she circulates.<br>Note: At this point, the participants are unaware of the 5 practices and the facilitator will monitor without informing participants. The intent will be to use this table in Activity #3B to illustrate to the participants how an active teacher will use this table in a classroom.<br><br>Facilitator will select and sequence which participants' responses to share with the group as a way of modeling the use of the 5 practices on the Garden Problem (with document camera).<br>The debrief of the problem will be a discussion of questions 4 and 5 on the Garden Problem worksheet.<br><br>To prepare for this Activity in the PD the facilitator should:<br>● Complete the garden problem prior to the PD.<br>● Use the sample monitoring table to help implement your modeling of the 5 practices.<br>● Add to the given sample monitoring table or create an original table.<br>● Be ready to continue filling in and add to the monitoring table as the participants work. | ● Garden Problem Handout<br>● Sample Monitoring table - anticipating<br>● Sample Monitoring table - completed<br>● Color tiles<br>● Document Camera<br>● (If a document camera is not available, use Poster Paper) |
| ½ hr | **Activity #2** Get to know your 5 practices<br>Each participant will read all of Chapter 1 in "5 Practices for Orchestrating Productive Mathematics Discourse" pgs. 7-12 (included as a PDF).<br><br>● Each group gets assigned one practice and creates a summative poster. The design of the poster is the group's choice (words, drawings, etc.).<br>● Facilitator displays posters in order. Participants engage in a gallery walk in order to review and add detail to each of the posters.<br><br>Summary Question:<br>Connect the 5 practices to the participants' experience with the Garden Problem. Identity how the facilitator implemented each practice.<br>Use Think/Pair/Share protocol | ● 5 practices: Chapter 1<br>● Poster Paper<br>● Markers |
| | **Activity #3A** Case of David Crane | ● 5 Practices pages 2-4 |

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| 1 hr.<br><br>3&4 | Everyone reads "Leaves and Caterpillars: The Case of David Crane" (pg. 3-4, Smith & Stein).<br><br>Table discussion: What might have helped deepen the mathematical discussion during David Crane's lesson?<br><br>Have a whole group discussion to share the ideas from table talk.<br>Alternative - If discussion is not proceeding, everyone can read Analyzing the Case of David Crane pg. 5-6.<br><br>**Activity #3B** Monitoring Tables to Organize Practices<br>Display via document camera the monitoring table completed during the Garden Problem from Activity #1. Explain the thinking behind your completion of the table.<br><br>Distribute the student-work handout, and give participants time to fill out a monitoring table based on the work of these eight students.<br><br>Using the Numbered Heads protocol, ask each table to report out the sequence of student solutions and the rationale. Ask: Is one order better than another? What important connections can be made among student solutions and to other key mathematical ideas? | ● *5 Practices* pages 2-6<br>● Monitoring table from Garden Problem in activity 1<br>● Numbered Heads protocol<br>● One page sheet of David Crane's student work<br>● Poster Paper<br>● Markers<br>● Post-it notes<br>● scissors (one per table)<br>● tape (one per table) |
| 40 min | **Activity #4A** Incorporate the five practices into an existing lesson plan.<br><br>Have participants, in small groups, use an existing problem (of high cognitive demand) from resources to plan for anticipating, sequencing, and connecting. (Participants who need a quality task may quickly find one on the MARS site http://map.mathshell.org/tasks.php .)<br>● Choose a task for which there are multiple likely strategies and representations for answers (Note the handout on characteristics of higher- and lower-level tasks provided to assist participants in choosing a rich task.)<br>● Have participants use a blank monitoring table to anticipate student responses and desired responses, keeping math goals of the lesson in mind<br>○ Consider misconceptions<br>○ Consider connections among anticipated student responses<br>○ Consider a sequencing of anticipated responses<br>● Regroup participants for presentation. Each person will present his/her "anticipate" column, and then share the sequence and connections considered. | ● Participants need to bring one of their own teaching resource books<br>● Blank copies of monitoring table<br>● Characteristics of Higher- and Lower Level Tasks |
| 10 min | **Wrap-up & Evaluation** Group Discussion<br>On a notecard, write a number for each of the following:<br>● With which of Smith and Stein's practices do you feel the most confident? Least? | ● Blank copies of monitoring tables for participants to take home |

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| | ● What is your implementation plan for Smith and Stein's discourse model?<br><br>Be ready to share at least one response from the prompts with the group. | |